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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,715	07/15/2003	Yoichi Momose	116220	7427
25944	7590	09/07/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			DI GRAZIO, JEANNE A	
			ART UNIT	PAPER NUMBER
			2871	
DATE MAILED: 09/07/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/618,715

Applicant(s)

MOMOSE, YOICHI

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on RCE June 24, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>July 2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claims***

Claims 1-9 and 14 are pending. Claims 1, 2, 5, 6 and 14 have been amended per RCE Amendment of June 24, 2005. Claims 10-13 have been cancelled.

### ***Priority***

Priority to Japanese Patent Applications 2002-212765 (July 22, 2002) and 2003-114360 (April 18, 2003) is claimed.

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 24, 2005 has been entered.

### ***Claim Objections***

Claims 1, 2, 5, 6 and 14 are objected to because of the following informalities:

Regarding claims 1, 2, 5, 6 and 14, the limitation “the seal material being arranged to not have a liquid crystal injection port and having no trace of having been sealed with a sealant” renders the claims confusing and unclear.

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While the Examiner presumes that Applicant means that there is no liquid crystal injection port, the limitation reads as a contradiction. The limitation reads as if there is a seal material and yet that there is no seal material. The claim might also be read to mean that even if there is a seal, that the seal is somehow invisible such that no trace of the seal is apparent.

However, for examination purposes, the Examiner presumes, as noted, that Applicant simply means that there is no injection port.

Appropriate correction is required.

Claims 1, 2, 5, 6, and 14 are objected to because of the following informalities:

These claims are further objected to because of the following limitation: “where a liquid crystal layer thickness in the region in which the spacers are disposed is represented by  $d$ , the cell thickness  $d$  being within a range of 2.83-3.26 microns.”

Said limitation is not entirely clear. Applicant’s “ $d$ ” refers to both the liquid crystal layer thickness AND cell thickness. However, liquid crystal layer thickness and cell thickness are not necessarily the same thing. Typically, cell thickness means the thickness of the liquid crystal layer plus / in addition to the thicknesses of the substrates.

Thus, it is not clear as to whether “ $d$ ” just refers to the liquid crystal layer thickness or the layer thickness plus substrate thicknesses.

For examination purposes, the Examiner presumes that “ $d$ ” means just the thickness of the liquid crystal layer.

Appropriate correction is required.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,392,736 B1 (to Furukawa et al.).

As to claim 1, Furukawa teaches and discloses a method of manufacturing a liquid crystal display element.

In an embodiment of the invention, Furukawa shows (Figure 1), a pair of substrates (21a and 21b) including an upper substrate and a lower substrate, spacers (spacer particles 25) located between the substrates (21a and 21b) the spacers (25) being fixedly adhered to the lower substrate (Abstract and Column 4, Lines 29-40) and a liquid crystal layer (28) between the substrates (21a and 21b), the liquid crystal layer (28) and spacers (25) being located in a region surrounded by a frame-shaped seal material formed in a plane of the substrate (seal resin 26, See also Column 12, Lines 35-37 ; Column 13, Lines 47-48), the seal material being arranged to not have a liquid crystal injection port and having no trace of having been sealed with a sealant (Abstract and Column 13, Lines 48-56) and a density of the spacers in the region ranging from 100 to 300/mm<sup>2</sup> (Column 13, Lines 25-27).

Furukawa does not appear to explicitly specify that the average particle size "D" of the spacers ranging from  $0.96d$  to  $d$  where  $d$  is a liquid crystal layer thickness in the region in which the

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spacers are disposed is represented by  $d$ , the cell thickness  $d$  being within a range of 2.83-3.26 microns.

However, Furukawa does specifically teach and disclose that bubbles between substrates is a function of spacer density, spacer diameter and amount of liquid crystal material such that it is necessary to adjust these parameters in order to prevent the disruptive occurrence of bubbles (Column 9, Lines 51-67 ; Column 10, Lines 7-12 ; entire patent).

It would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to at least optimize spacer size and layer thickness to prevent bubbles.

As to claim 2, Furukawa teaches and discloses a method of manufacturing a liquid crystal display element.

In an embodiment of the invention, Furukawa shows (Figure 1), a pair of substrates (21a and 21b) including an upper substrate and a lower substrate, spacers (spacer particles 25) located between the substrates (21a and 21b) the spacers (25) being fixedly adhered to the lower substrate (Abstract and Column 4, Lines 29-40) and a liquid crystal layer (28) between the substrates (21a and 21b), the liquid crystal layer (28) and spacers (25) being located in a region surrounded by a frame-shaped seal material formed in a plane of the substrate (seal resin 26, See also Column 12, Lines 35-37 ; Column 13, Lines 47-48), the seal material being arranged to not have a liquid crystal injection port and having no trace of having been sealed with a sealant (Abstract and Column 13, Lines 48-56) and a density of the spacers in the region ranging from 150 to 300/mm<sup>2</sup> (Column 13, Lines 25-27).

Furukawa does not appear to explicitly specify that the average particle size "D" of the spacers ranging from  $0.96d$  to  $d$  where a liquid crystal layer thickness in the region in which the

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spacers are disposed is represented by  $d$ , the cell thickness  $d$  being within a range of 2.83-3.26 microns.

However, Furukawa does specifically teach and disclose that bubbles between substrates is a function of spacer density, spacer diameter and amount of liquid crystal material such that it is necessary to adjust these parameters in order to prevent the disruptive occurrence of bubbles (Column 9, Lines 51-67 ; Column 10, Lines 7-12 ; entire patent).

It would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to at least optimize spacer size and layer thickness to prevent bubbles.

As to claim 3, as noted, the seal material is formed into the form of a closed frame (Column 13, Lines 47-48).

As to claim 4, the spacers are covered with an adhesive (Abstract).

As to claims 5 and 6, the method of manufacturing the liquid crystal device would have been obvious to one of ordinary skill in art of liquid crystals at the time the invention was made in view of the device(s) as taught and disclosed throughout embodiments of Furukawa to prevent bubbles.

As to claim 7, the substrate adhesion is carried out under vacuum (Figure 5).

As to claim 8 as noted, the spacers are covered with an adhesive (Abstract).

As to claim 9, it would have been obvious to those of ordinary skill in the art of liquid crystals at the time the invention was made to incorporate the display device into electronic equipment since devices are typically used in electronic equipment,

As to claim 14, Furukawa teaches and discloses a method of manufacturing a liquid crystal display element.

In an embodiment of the invention, Furukawa shows (Figure 1), a pair of substrates (21a and 21b) including an upper substrate and a lower substrate, spacers (spacer particles 25) located between the substrates (21a and 21b) the spacers (25) being fixedly adhered to the lower substrate (Abstract and Column 4, Lines 29-40) and a liquid crystal layer (28) between the substrates (21a and 21b), the liquid crystal layer (28) and spacers (25) being located in a region surrounded by a frame-shaped seal material formed in a plane of the substrate (seal resin 26, See also Column 12, Lines 35-37 ; Column 13, Lines 47-48), the seal material being arranged to not have a liquid crystal injection port and having no trace of having been sealed with a sealant (Abstract and Column 13, Lines 48-56) and a density of the spacers in the region ranging from 100 to 300/mm<sup>2</sup> (Column 13, Lines 25-27).

Furukawa does not appear to explicitly specify the spacers extending a distance ranging from  $0.96d$  to  $d$  from the lower substrate where a liquid crystal layer thickness in the region in which the spacers are disposed is represented by  $d$ , the cell thickness  $d$  being within a range of 2.83-3.26 microns.

However, Furukawa does specifically teach and disclose that bubbles between substrates is a function of spacer density, spacer diameter and amount of liquid crystal material such that it is necessary to adjust these parameters in order to prevent the disruptive occurrence of bubbles (Column 9, Lines 51-67 ; Column 10, Lines 7-12 ; entire patent).

It would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to at least optimize spacer size and layer thickness to prevent bubbles.

*Response to Arguments*

Applicant's arguments with respect to said claims have been considered but are moot in view of the new ground(s) of rejection.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio  
Patent Examiner  
Art Unit 2871

JDG



DUNG T. NGUYEN  
PATENT EXAMINER